background is not a plane as in the convex mirror, but the surface of a sphere, and that the proportion in which the images, as they approach the spherical surface contract, has a different mathematical expression."

But in reality these differences are so fundamental as to make all the difference between Euclidean and non-Euclidean; for the changed measure for distance in the mirror world is still Euclidean, parabolic, using an imaginary conic in the plane background as 'absolute' in Cayley's sense.

Thus Helmholtz reproduced the old but false theorem that in space of positive curvature two geodetic lines, if they in general cut, must necessarily cut in *two* points. He never attained the conception of single elliptic space, the type-form, but speaks only of 'spherical space of three dimensions.'

It is to be hoped that Professor Willson's book may hasten the day in America when courses in descriptive geometry and pure projective geometry, no longer confined to science schools, may be available in every college, and when there may be a more adequate realization of the power of spatial imaging as an instrument in scientific research.

GEORGE BRUCE HALSTED.

AUSTIN, TEXAS.

Chapters on the Natural History of the United States. By R. W. SHUFELDT, M. D., etc. New York, Studer Bros. 1897. Pp. 480.

This volume is a collection of articles, most of which were published originally in 'Shooting and Fishing' and other periodicals, and now reappear, revised and somewhat expanded. A wide range of topics is covered—insects, crustaceans, fishes, amphibians, reptiles, birds and mammals occupy one or more chapters each, by far the larger space being given to birds. As a rule, each chapter treats some general subject, such as 'Crayfish and Crabs,' 'Gulls and their Allies,' 'The American Warblers and Sparrows,' passing the whole group in review, mentioning some of its more striking forms, and giving detailed descriptions of one or two species, with extended accounts of their habits, these latter often augmented by quotations of considerable length from various well-known authors. The anatomy of the animal under consideration is occasionally touched upon and questions of classification are frequently discussed—matters which, it may be feared, will not prove very interesting to the general reader, for whom the work is intended.

The book is illustrated with a hundred and thirty figures, many of them occupying full pages. Nearly one-half are reproductions of photographs of living animals, and are worthy of considerable study for the light they throw upon the possibilities and the difficulties in the use of photography for zoological illustration.

C. F. B.

SOCIETIES AND ACADEMIES.

BIOLOGICAL SOCIETY OF WASHINGTON, 287TH MEETING, SATURDAY, FEBRUARY 26.

DR. E. A. DE SCHWEINITZ presented a paper on 'The Treatment of some Animal Diseases with Antitoxic Serums,' briefly reviewing the work as carried on in the Bureau of Animal Industry some years ago for the purpose of treating animals with the poisons formed by the swine plague and cholera suis germs. This work was fairly successful from an experimental standpoint, but did not seem to warrant practical use in the field on account of many difficulties which might arise. The preliminary experiments made in the Biochemic Laboratory with the serum of animals immune to cholera suis, in 1892, and again with those immune to cholera suis and swine plague germs, published in August, 1896, showed that these two diseases of swine which cause such enormous losses to the farmers of the country could be cured in experimental animals. Accordingly, practical field experiments were tried, which demonstrated that sick herds could be greatly benefited and a large portion of the animals cured if they were given injections of sufficiently strong serum that had been carefully prepared for the purpose of curing the two diseases above mentioned. The expense of this method if legitimately conducted is comparatively small, and it is possible to prepare a serum that would have the desired curative effect which should not cost more than 10 cents for each injected animal. Further practical experiments on a more extensive scale will be conducted, but the